CHAPTER 2
DATABASE DEVELOPMENT

2-1. Database conception

The heart of the data analysis is the database. The database is a tool that not only stores the data but also provides a user-friendly tool to download the data and most importantly to report it in the format the individual user needs it. Without addressing these specific needs the database becomes more of hindrance and would slow down the analysis process. Therefore before starting this data collection process the database issue was addressed by the staff.

a. A computerized database named PREPIS (Power Reliability Enhancement Program Information System) was developed to assist technical staff in organizing, tracking, analyzing, and reporting all of the technical and contact information during the execution of the data collection program.

b. The two major components in PREPIS were contact and equipment records. The contact record contained site information and was comprised of 6208 contact records. The equipment records contained performance and maintenance information and included 4043 equipment records.

c. This comprehensive database system was organized functionally to support the following tasks:

(1) Record individual site information

(2) Prioritize site visits

(3) Collect and organize site data

(4) Input and verify data

(5) Analyze and summarize data

(6) Generate reports

d. The output record generator contained several “canned” reports designed for data summary and availability calculations. Some of the reports were designed to allow the user the flexibility to select a multitude of query topics. The format of the report generator allowed construction of custom reports for individual needs.

e. Although this database was adequate for the task when it was developed in 1991, as new, more popular and efficient database tools were developed it became apparent that a more portable, user friendly database tool was needed. In addition, several inquiries of the database resulted in a significant effort to recreate data reports to satisfy requests. Obviously, a better method was needed to minimize this time.

2-2. Database update

In 1998 the arduous task was begun to create a common database that would provide similar abilities as before but improve upon them and allow for the information to be easily transferable from personal computer (PC) to PC. These requirements lead the involved personnel to agree upon choosing Microsoft Office Access for this task because of its industry wide use and flexibility.

a. Once the data was transferred into Microsoft Office Access, simple reports and queries were written allowing the user the ability to develop customized data extraction scenarios on a PC. The following is a list of the reliability metrics that the database is capable of reporting on the components in any combination:

(1) Reliability

(2) Operational Availability

(3) Inherent Availability

(4) Unit Years (total calendar hours of data divided by 8760)

(5) Number of failures recorded

(6) Failure Rate

(7) Mean Time Between Failures

(8) Mean Time to Repair

(9) Mean Time to Maintain

(10) Mean Down Time

(11) Mean Time Between Maintenance

(12) Average Hours of Downtime per Year

b. The new database provides a tremendous amount of flexibility. It provides the capability of running a customized report on any component in the database with different combinations of metrics. Since the database and the reports run on one of the most popular and readily available databases, they can easily be placed on a CD or other portable storage media device and transferred to anyone with Microsoft Office Access.

c. This new database also aids the data collection and analysis procedure due to its compatibility with Microsoft EXCEL. Because EXCEL is the preferred software package for collecting and analyzing site specific data, this task is simplified. Once the engineer formats the data in EXCEL, it can easily be downloaded to the ACCESS database for storage and future reports.